

Original Investigation

Intention to quit smoking among lesbian, gay, bisexual, and transgender smokers

Jack E. Burkhalter, Barbara Warren, Elyse Shuk, Louis Primavera, & Jamie S. Ostroff

Abstract

Introduction: Smoking is highly prevalent among lesbian, gay men, bisexual, and transgender (LGBT) persons and contributes to health disparities. Guided by the theory of planned behavior (TPB), we identified beliefs related to attitudes, perceived behavioral control, and subjective norms, as well as LGBT-specific variables, to explain variance in intention to quit smoking in the next 6 months in LGBT smokers.

Methods: Individual interviews ($n = 19$) identified beliefs about quitting smoking and LGBT-salient variables and aided in survey development. Surveys were sent to a random sample from an LGBT community center's mailing list and center attendees, with a 25.4% response rate. Bivariate and multivariate analyses were conducted with the final sample of 101 smokers.

Results: No sociodemographic or LGBT-specific variables beyond the TPB constructs were related to intention to quit smoking. A multivariate TPB model explained 33.9% of the variance in quitting intention. More positive attitudes and specific beliefs that cessation would make smokers feel more like their ideal selves and improve health and longevity were related to greater intention to quit (p values $< .05$). Subjective norm and perceived behavioral control were marginally significant, with perceived approval of partners and others and beliefs that life goal achievement would make it easier to quit positively related to intention. Depression and stress levels were high.

Discussion: This is among the first studies to examine theoretically grounded variables related to intention to quit smoking in LGBT smokers. We identified specific behavioral, normative, and control beliefs that can serve as intervention targets to reduce smoking in the LGBT community.

Introduction

Smoking prevalence is significantly higher among lesbians, gay males, and bisexual men and women than is observed for comparable gender groups in the general U.S. population. In gay and bisexual men, prevalence is from 27% to 71% higher (Greenwood et al., 2005; Gruskin, Greenwood, Matevia, Pollack, & Bye, 2007; Stall, Greenwood, Acree, Paul, & Coates, 1999; Tang et al., 2004), and for lesbians and bisexual women, it is 70%–350% higher (Burgard, Cochran, & Mays, 2005; Gruskin et al.; Tang et al.). Although similar data for transgender persons are lacking, this population experiences high rates of substance abuse; depression, social, and employment discrimination; and HIV infection (Clements-Nolle, Marx, Guzman, & Katz, 2001; U.S. Department of Health and Human Services [USDHHS], 2001), characteristics which are typically associated with a higher prevalence of smoking in the general population (Droomers, Schrijvers, & Mackenbach, 2002; National Cancer Institute [NCI], 2000). Gay and bisexual men account disproportionately for HIV infection cases (Centers for Disease Control and Prevention, 2007), and HIV positive persons smoke at rates substantially above the general population (Burkhalter, Springer, Chhabra, Ostroff, & Rapkin, 2005; Collins et al., 2001; Gritz, Vidrine, Lazev, Amick, & Arduino, 2004). Thus, smoking and tobacco-related diseases are significant health concerns for the lesbian, gay, bisexual, and transgender (LGBT) community.

To design interventions appropriate for LGBT smokers, it is important to examine specific barriers to and facilitators of smoking cessation. Health behavior change theories aid in this effort because they capture factors strongly related to actual behavior change, including barriers and facilitators (NCI, 2005). The role of social-cognitive variables in motivation to quit smoking is well described for the general population (Hyland et al., 2006; West, McEwen, Bolling, & Owen, 2001) and many specific subpopulations—for example, African American smokers

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(Pederson, Ahluwalia, Harris, & McGrady, 2000)—but similar data are lacking for LGBT persons. Because LGBT persons are stigmatized and prevalence of smoking is high, social-cognitive factors have potential to explain their tobacco use behaviors.

Guiding our examination of barriers and facilitators of smoking cessation in LGBT persons, the theory of planned behavior (TPB; Ajzen, 1985) proposes that the proximal determinants of a particular behavior are *behavioral intention* and *perceived behavioral control* (see Figure 1). Intention to perform a given behavior subsumes several factors that influence behavioral enactment. Perceived behavioral control is determined by perceptions of controllability and self-efficacy to enact the behavior. Behavioral intentions are a function of *attitudes* about the behavior, *subjective norm*, and *perceived behavioral control*. Subjective norm encompasses perceptions of what important members of the person's social network think the person should or should not do regarding the behavior, as well as for normative prevalence of the behavior. Attitudes represent the overall evaluation of the behavior and include both cognitive and affective aspects. Prospective studies demonstrate that intentions predict attempts to quit smoking in the general population (Godin, Valois, Lepage, & Desharnais, 1992) as well as in subpopulations (Armitage, 2007; Johnston, Johnston, Pollard, Kinmonth, & Mant, 2004; Norman, Conner, & Bell, 1999). More positive attitudes, greater perceived social approval by persons in their social network, and greater perceived behavioral control regarding quitting are associated with higher levels of intention, which, in turn, predict quitting or maintaining abstinence (Bennet & Clatworthy, 1999; Borland, Owen, Hill, & Schofield, 1991; Godin et al.; Hanson, 1997; Hu & Lanese, 1998; Maher & Rickwood, 1997; Nguyet, Beland, & Otis, 1998). Attitudes, subjective norm, and perceived behavioral control account for 26%–54% of the variance in tobacco use intentions, and each varies in its strength of association with tobacco use intentions across diverse study populations.

Formative work, or an elicitation study, is recommended in special populations in order to identify specific, salient beliefs (Ajzen, 1991), which may extend the explanatory power of the TPB constructs. Thus, this study had as a primary aim to identify behavioral, normative, and control beliefs that underlie, respectively, the TPB constructs of attitude, subjective norm, and perceived behavioral control in a sample of LGBT smokers. Second,

we wished to determine if relevant psychosocial variables not directly captured in the TPB could add value to TPB antecedents in explaining variation in intention to quit smoking in this special population. Third, we intended for findings to aid in formulating appropriate LGBT smoking cessation interventions.

Methods

Participants and procedure

Participants in the elicitation phase of the study were recruited from two New York City locations: the Bronx Lesbian and Gay Health Resource Consortium (since renamed the Bronx Community Pride Center) and the LGBT Community Center located in Manhattan. The quantitative phase of the study was conducted in collaboration with the LGBT Community Center only. The study received a research waiver from the institutional review board of Memorial Sloan-Kettering Cancer Center. We conducted key informant interviews with 19 self-identified LGBT persons (≥ 18 years old) who were current smokers and who were active in LGBT community organizations. The interviews lasted about 45 min and used mostly open-ended questions, and all participants received \$20. Questions explored behavioral beliefs, normative referents, and control and self-efficacy beliefs related to intention to quit smoking in the next 6 months, as well as other variables relevant to LGBT persons. The interviews were transcribed, and a qualitative research specialist (E.S.) applied a systematic analytic regime to each transcript and made a composite list of themes. Salient themes were then synthesized and summarized. These themes, reported elsewhere (Burkhalter, Shuk, Warren, Rowland, & Ostroff, 2005), informed the measurement tools for the study's quantitative phase.

The second phase of the study entailed a cross-sectional, anonymous survey of persons who identified as LGBT and were at least 18 years of age. The LGBT Community Center maintained an active mailing list of more than 40,000 individuals living in the New York City region, and some 6,000 persons use the facility per week. We sampled persons on the mailing list and those using the Center's services over a 6-month period in 2005. We randomly sampled 1,121 names from the mailing list, which included an oversampling by 10% of identifiable females in order to ensure a sufficient sample of female respondents. The surveys were mailed by standard U.S. postal service once, and each survey packet included a free movie coupon and a postage-paid return envelope. To ensure anonymity, respondents were asked not to write any identifying information on the survey. We received 268 survey responses. An additional 138 surveys were returned due to wrong addresses, and 2 surveys were unusable. This study's sample comprised 101 smokers of the 266 LGBT persons submitting usable surveys.

Measures

Sociodemographic characteristics were assessed using standard items. Sexual orientation (lesbian/gay, bisexual, heterosexual, or other), gender identity (female, male, or other), transgender identity (yes or no), and relationship status (single, coupled, or other status) were each assessed. We assessed HIV serostatus (positive, negative, or unknown).

Tobacco use was assessed with these items (USDHHS, 2005): lifetime smoking of at least 100 cigarettes (yes/no), current

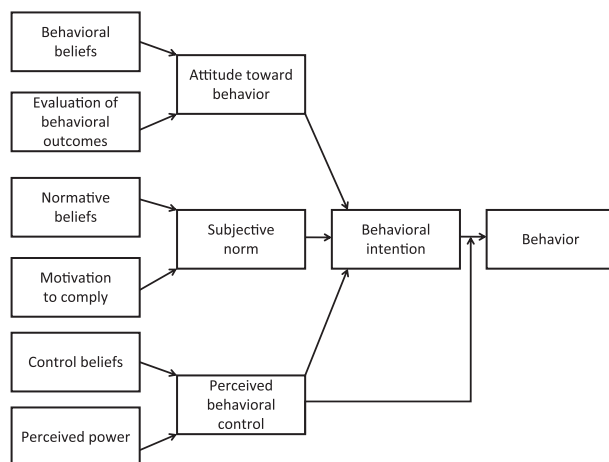


Figure 1. Theory of planned behavior.

smoking pattern (daily, occasionally, not at all), number of cigarettes smoked daily, years of regular smoking, number of prior quit attempts, and longest period of cessation in the past year. Current smokers were those who had smoked at least 100 cigarettes in their lifetime and currently smoked daily or occasionally. We assessed nicotine dependence with one item asking how soon after waking the first cigarette was smoked (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). We asked whether the 2003 New York City indoor smoking ban changed their smoking (cut down/quit vs. no change/increased), percentage of friends who smoked, whether their household included other smokers, and, if partnered, the partner's smoking status.

TPB-based measures. Items directly and indirectly measuring the TPB's three antecedents of intention employed typical phrasing and response scales that were adapted and supplemented, based on the elicitation phase (Ajzen, 2002; Francis et al., 2004). All TPB items were anchored to the index behavioral intention of "quitting smoking within the next six months," henceforward shortened to "quit(ing) smoking." Items for each of the four directly measured TPB constructs were analyzed for reliability (Cronbach's α), and items were removed when internal consistency improved substantially. All items used a 7-point response scale with scale endpoints anchored by verbal descriptors. Belief items were not submitted to internal reliability testing because a smoker may hold contradictory beliefs about quitting. The behavioral belief composites were the product of the outcome evaluation and the behavioral belief strength scores. Similarly, we assessed indirect subjective norms, or normative referents, which were the product of each subjective norm's strength and the value of motivation to comply for that item. We assessed perceived behavioral control directly with three items and control beliefs with four items. Perceived power for each control belief was not assessed; thus, no belief composites could be calculated for perceived behavioral control.

Intention to quit smoking was assessed using four items ($\alpha = .88$) based on TPB method (Ajzen, 2002) and other studies (Norman et al., 1999): "I will make an effort to quit smoking (*unlikely-likely*)," "I intend to quit smoking (*strongly agree-strongly disagree*)," "I expect to quit smoking (*definitely true-definitely false*)," and "How likely is it that you will quit smoking (*unlikely-likely*)?" Direct attitudes ($\alpha = .70$) toward quitting smoking were assessed with three items: "Quitting smoking would be (*harmful-beneficial; good-bad; worthless-valuable*)." Indirect measures of attitude were tapped with eight items, each with the response scale *definitely true-definitely false*, unless otherwise noted: "My quitting smoking would improve the health of my lungs," "I would feel a strong sense of loss if I quit smoking," "My quitting smoking would make me feel less unique as a person," "If I quit smoking, I would live longer," "My quitting smoking would make me feel more like the person I want to be—my ideal self," "I will have difficulty meeting new people if I quit smoking," "I will feel more stressed if I quit smoking," and "If I quit smoking, other smokers I know would be inspired to quit smoking, too (*completely true-completely false*)." Due to restricted range and lack of affective items in the direct measures of attitudes, the final attitude measure comprised the mean of the 11 direct items and indirect composites. Three items ($\alpha = .67$) assessed subjective norm directly: "Most people important to me think I (*should-should not*) quit," "Most people whose opinions I value would approve if I quit smoking (*strongly agree-strongly disagree*)," and "The people I work with think that I (*should-*

should not) quit." Three indirect measures of subjective norm were "My partner/lover thinks I (*should-should not*) quit smoking," "Most people important to me have quit smoking (*completely true-completely false*)," and "In the LGBT community, most people smoke (*completely true-completely false*)." Due to restricted range of the direct subjective norm items, the final subjective norm was the mean of six direct and indirect composite items. In analyses, we used the mean of seven items that assessed perceived behavioral control ($\alpha = .61$): "I am confident that if I wanted to I could quit smoking (*definitely false-definitely true*)," "How much control do you believe you have over quitting smoking? (*no control-complete control*)," and "Quitting smoking would be (*difficult-easy*)." Four control beliefs used the response format of *strongly agree-strongly disagree*: "Achieving an important goal I have for myself in the next six months would make it easier for me to quit," "Having a health symptom/illness caused or made worse by smoking in the next six months would make it easier to quit," "Having emotional stress due to problems with family or friends in the next six months would make it harder for me to quit," and "Spending time with friends or a lover/partner who smokes would make it harder for me to quit."

LGBT-specific measures. We adapted phrasing in preexisting scales to include all LGBT persons. We used three items ($\alpha = .61$) from the *Internalized Homophobia—Short Form* (Herek, Cogan, & Gillis, 2000) to examine individuals' feelings about being LGBT (e.g., I wish I were not LGBT). We included nine items ($\alpha = .76$) from the *Collective Self-Esteem Questionnaire* (Luhtanen & Crocker, 1991, 1992) to assess the individual's engagement in and evaluations of the LGBT community. To tap participants' experiences as LGBT identified, we included six items adapted from a prior study of gay men (Stall et al., 2001)—for example, number of people within one's social circle who are living with HIV, how "out" to others the person is regarding degree of disclosure about sexual or gender identity, and experiences of verbal harassment or physical violence as a consequence of being LGBT. To assess perceived stigma for being LGBT, we used five items ($\alpha = .87$) from the *Measures of Daily Gay Life* (Frale, Wortman, & Joseph, 1997).

Stress and depression. The *Perceived Stress Scale—Brief* (Cohen, Kamarck, & Mermelstein, 1983) measured the degree to which situations in one's life are appraised as stressful ($\alpha = .81$). Depression symptoms were assessed using the *Center for Epidemiological Studies Depression Scale* (CES-D; $\alpha = .91$; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977).

Substance use. Alcohol use was assessed with items on drinking pattern and number of drinks consumed in the past month (Behavioral Risk Factor Surveillance System, 2004). Illicit substance use in the past 6 months was assessed, with total number of illicit drugs used for analyses (Stall et al., 2001).

Perceived susceptibility to cancer was assessed with one item: "If you were to continue smoking, what would be the chances, or percentage likelihood, that you will develop cancer?" The response scale was a 10-mm line with verbal endpoints of "0%—Definitely won't develop cancer" to "100%—Definitely will develop cancer" (Diefenbach, Weinstein, & O'Reilly, 1993).

Analyses

All statistical analyses were conducted using SPSS (2006). We conducted bivariate analyses for all study variables with mean

intention to quit smoking within the next 6 months. Pearson product-moment correlations were used for continuous variables and *t* tests or one-way analysis of variance for categorical variables. Tests yielding *p* values <.05 were used to select variables for entry into the multivariate model. A multivariate linear regression analysis with hierarchical entry procedures was used, with intention to quit smoking as the dependent variable (Francis et al., 2004). Our a priori statistical power calculations ($\alpha = .05$, $\beta \geq .80$) allowed testing up to four additional variables beyond the theory's antecedents in the multivariate model. Variables correlated with quitting intention were entered in the second step of the multivariate model.

Results

The sample included 101 respondents with a mean age of 39.4 years, 63% identified as being male, 88% identified as gay/lesbian, and 10% as bisexual; 80% had a college or graduate degree; most (70%) were single; and 36% identified as an ethnic or racial minority (Table 1). The mean number of cigarettes smoked per day was 14.7, and mean pack-years was 15.3.

None of the sociodemographic variables or other variables hypothesized to be salient for LGBT persons was significantly associated with intention to quit smoking ($p > .05$; Table 1). Among the tobacco use variables, number of quit attempts in the past year was associated with intention, with those reporting a history of 2–5 quit attempts having a significantly higher intention to quit smoking than those reporting 0–1 quit attempts ($p < .01$).

Next, the multivariate model was examined with the first step entailing the regression of attitude, subjective norm, and perceived behavioral control variables onto intention to quit smoking. The multivariate model (see Table 2) in Step 1 was significant, $F(3, 90) = 15.41$, $p < .001$, accounting for 33.9% of the variance in intention to quit smoking. Only attitude was significantly related to intention, but subjective norm and perceived behavioral control were each at $p < .10$. In Step 2, the addition of number of prior quit attempts fell short of significance, R^2 change = 2.1%; F change (1, 89) = 2.89, $p = .09$. To examine potential differences by gender regarding cessation intentions, we conducted two additional multivariate analyses. Models for men and women were similar, with, respectively, $R^2 = .325$ and $R^2 = .335$, and attitude emerged as the only statistically significant correlate (p values <.05) in each model.

We conducted univariate correlations between intention and each behavioral belief item or composite variable. Among the beliefs, “ideal self” was most strongly correlated with intention ($r = .55$, $p < .001$), followed by “health of lungs” ($r = .43$, $p < .001$). Among the normative beliefs, “partner/lover thinks I should quit” was most correlated with intention ($r = .36$, $p < .01$), but since many in the sample were not partnered, the *n* was substantially smaller than for the other normative beliefs. “Most people whose opinions I value” was next most correlated ($r = .31$, $p < .01$), followed closely by the descriptive normative belief “Most people who are important to me have quit” ($r = .30$, $p < .01$), as well as the injunctive belief “Most people who are important to me think that I should quit” ($r = .21$, $p < .05$). “Achieving an important goal” ($r = .24$, $p < .05$) and “having a health symptom/illness made worse” ($r = .21$, $p < .05$) were the only two control beliefs correlated with intention.

Discussion

To our knowledge, this is the first published study to use a theoretically grounded approach in examining intention to quit smoking among LGBT smokers. The TPB guided the method of eliciting and quantifying LGBT smokers' attitudes, perceived behavioral control, subjective norm, and the specific beliefs attached to each in understanding intention to quit smoking. The sample was diverse in race, ethnicity, gender identity, and socioeconomic status and reflects a U.S. subpopulation that is primarily urban (Bradford, Barrett, & Honnold, 2002). The three antecedents in the TPB explained 34% of the variance in intention to quit smoking, which is in line with findings (24%–54%) from prior TPB tobacco use studies (Borland et al., 1991; Godin et al., 1992; Hanson, 1997; Hu & Lanese, 1998; Maher & Rickwood, 1997; Nguyet et al., 1998; Norman et al., 1999). Attitude was the strongest correlate of intention to quit, and to a lesser extent, perceived behavioral control and subjective norm were related to intention ($p < .10$). More positive attitudes, greater perceived behavioral control and self-efficacy for quitting, and stronger perceived normative support or pressure to quit smoking were associated with stronger intention to quit smoking. No sociodemographic or psychosocial variables beyond the TPB constructs were related to intention to quit smoking.

Examination of specific beliefs underlying each TPB antecedent yielded potential targets for enhancing motivation to quit smoking in this sexual minority. For instance, an affective behavioral belief (“feeling more like the person I want to be—my ‘ideal self’”) was most strongly associated with intention to quit. This belief item had been framed to capture aspirations and future milestones that LGBT smokers expressed when thinking about quitting smoking. Linking the achievement of smoking abstinence with aspirations for self-attainment may help LGBT smokers form stronger intentions to quit. Behavioral beliefs about health and smoking (“would improve the health of my lungs” and “I would live longer”) and a control belief that “having a health symptom or illness caused or made worse by smoking” also emerged as significant correlates of intention to quit. Concerns about health are among the most potent motivators of smoking cessation (Curry, Grothaus, & McBride, 1997). It is logical that aspirations and future goals would depend upon optimizing or preserving physical health. Notably, the correlations between the “ideal self” belief and the two beliefs about “lung health” and “longer life” were .50 and .41 (p values <.001), respectively, supporting this assertion. Although normative beliefs did not show as strong a relationship to intention as did behavioral beliefs, having a partner who supports cessation and believing that valued others would approve were associated with stronger intention to quit. Building normative support for cessation and emphasizing the interpersonal gains from quitting smoking could facilitate cessation in the LGBT community. An additional control belief, that is, “achieving an important goal (besides smoking cessation),” was associated with greater quitting motivation. Both control beliefs echo the behavioral beliefs that tapped personal aspiration and the impact of smoking and cessation on health. In sum, these findings suggest that cessation interventions may be more effective if they identify and magnify the links among personal goals and aspirations, health concerns, and achieving abstinence from tobacco. Interventions can target beliefs by attacking the strength of the belief—for example, how strongly one

Table 1. Sample characteristics and bivariate statistics for intention to quit smoking

Variable	Total sample		Intention to quit smoking	
	<i>n</i>	<i>M (SD)</i> or %	<i>M (SD)</i>	Pearson <i>r</i>
Attitudes ^a	95	21.34 (5.18)		.524**
Subjective norm ^a	95	17.04 (8.16)		.342**
Perceived behavioral control ^a	95	4.07 (1.33)		.257*
Intention to quit smoking ^a	95	4.71 (1.84)		—
Age	101	39.41 (11.09)		.050
Gender identity	100			
Male	63	63.0%	4.88 (1.75)	
Female	35	35.0%	4.41 (1.89)	
Other	2	2.0%	4.00 (4.24)	
Transgender identity	99			
Yes	5	5.1%	4.85 (2.40)	
No	94	94.9%	4.67 (1.82)	
Sexual orientation	101			
Homosexual	89	88.1%	4.78 (1.86)	
Bisexual	10	9.9%	4.62 (1.38)	
Other	2	2.0%	2.50 (2.12)	
Education	101			
High school or less	20	19.8%	4.42 (1.75)	
Greater than high school	81	80.2%	4.79 (1.86)	
Ethnicity	101			
White, non-Hispanic	65	64.4%	4.51 (1.90)	
Minority (all others)	36	35.6%	5.06 (1.70)	
Relationship status	99			
Single (with 0, 1, or more partners)	69	69.7%	4.62 (1.85)	
Coupled or married	30	30.3%	4.80 (1.80)	
Income (annual)	101			
<\$50,000	63	62.4%	4.63 (1.83)	
>\$50,000	38	37.6%	4.86 (1.86)	
Occupation	100			
Employed	72	72.0%	4.72 (1.86)	
Unemployed	8	8.0%	4.22 (1.45)	
Student	8	8.0%	4.43 (2.07)	
Other	12	12.0%	4.98 (1.91)	
HIV serostatus	99			
Negative	71	71.7%	4.68 (1.84)	
Positive	17	17.2%	4.82 (1.94)	
Unknown	11	11.1%	4.85 (2.01)	
Cigarettes smoked per day	88	14.67 (8.37)		-.009
Frequency of tobacco use	101			
Daily	78	77.2%	4.73 (1.81)	
Occasionally	23	22.8%	4.65 (1.98)	
Pack-years	87	15.34 (13.91)		-.077
Number of lifetime quitting attempts	100			
0-1	27	27.0%	3.68 (2.15)*	
2 or more times	73	73.0%	5.10 (1.56)*	
Longest quit attempt in past year (days)	97	36.20 (77.95)		.111
Smoke within 30 min after waking?	98			
Yes	59	60.2%	4.57 (1.86)	
No	39	39.8%	4.96 (1.72)	
If in relationship, does partner smoke? ^b	54			
Yes	25	46.3%	4.61 (2.03)	
No	29	53.7%	4.81 (1.72)	
Does your household have other smokers?	101			
Yes	32	31.7%	4.81 (1.78)	
No	69	68.3%	4.67 (1.87)	

Table 1. Continued

Table 1. Continued

Variable	Total sample		Intention to quit smoking	
	<i>n</i>	<i>M (SD)</i> or %	<i>M (SD)</i>	Pearson <i>r</i>
What percent of close friends smoke?	101			
Almost none/no friends smoke	24	23.8%	4.70 (2.00)	
About 25% smoke	38	37.6%	4.53 (1.81)	
About 50% or more smoke	39	38.6%	4.90 (1.80)	
Impact of New York City ban on smoking	95			
No change or increased my smoking	60	63.2%	4.56 (1.83)	
I cut down or quit smoking	35	36.8%	5.18 (1.85)	
Level of being “out” to others ^c	95	4.22 (1.05)		-.059
Participation in LGBT organizations ^d	101	2.06 (0.95)		.048
Community self-esteem ^e	100	4.04 (0.62)		.062
Internalized homophobia ^e	100	4.37 (1.95)		.066
Perceived stigma ^f	101	3.07 (0.94)		-.099
Verbal harassment or physical violence	101			
Yes	25	24.8%	4.55 (1.95)	
No	76	75.2%	4.77 (1.81)	
No. persons living with HIV in social circle	92	4.37 (10.34)		.119
CES-D	101	16.68 (11.19)		-.087
Perceived stress	100	5.83 (3.23)		-.113
No. alcoholic drinks per month	98	33.25 (56.80)		-.096
No. illicit drugs used in past 6 months	95	1.04 (1.73)		.173
Perceived susceptibility to cancer	96	52.94 (24.19)		.047

Notes. CES-D = Center for Epidemiological Studies Depression Scale; LGBT = lesbians, gay men, bisexuals, and transgender. Numbers vary by variable due to missing data.

^aAttitude variable's range of mean values was 4.73–33.09; subjective norm variable's range of mean values was 2.20–37.83; perceived behavioral control and intention to quit smoking variables' range of mean values was 1.00–7.00.

^bRespondents could report as being “single” but with 0, 1, or more “committed partners”; thus, single persons could report that their partner smokes.

^cFive-point scale: 1 = *None* (0%); 2 = *Some* (1%–40%); 3 = *Around half* (about 50%); 4 = *Most* (60%–90%); and 5 = *All* (100%).

^dFive-point scale: 1 = *Never*; 2 = *Not very often*; 3 = *Sometimes*; 4 = *Often*; and 5 = *Very often*.

^eFive-point scale: 1 = *Strongly disagree*; 5 = *Strongly agree*.

^fFive-point scale: 1 = *Not at all common*; 5 = *Very common*. One item used a 4-point scale and scores were weighted accordingly.

p* < .01; *p* < .001.

believes that quitting smoking will improve lung health; or by attacking the scale value associated with that belief (here, the outcome expectancy for a behavioral belief)—for example, how important it is to have healthy lungs (Ajzen, 2008). Persuasive communications can be developed to promote shifts in belief parameters that will favor smoking cessation.

We did not find, as others have, that perceived behavioral control was the strongest correlate of intention (Hu & Lanese, 1998; Norman et al., 1999), but there is substantial variability in studies regarding which, and how many, of the TPB constructs emerge as significant for intention to quit smoking (Armitage, 2007; Rise, Kovac, Kraft, & Moan, 2008). Methodological differences may account for dissimilar findings, but it is expected that the importance of each TPB construct will vary by population and behavior under study (Ajzen, 1991). Researchers have examined the contribution of non-TPB constructs in explaining the variation in intention to quit smoking. In this study, number of prior quit attempts was the only non-TPB variable to meet multivariate model criteria, and it trended toward being positively related to intention to quit smoking. This suggests that LGBT smokers who try to quit and fail are not necessarily discouraged from future attempts to quit. Ongoing opportunities

and support for cessation are important for building cessation experience and in sustaining motivation to quit.

Despite our inclusion of LGBT-relevant measures in the study, none were associated with intention to quit smoking. The TPB

Table 2. Multivariate hierarchical regression of intention on theory of planned behavior constructs and other variables (*n* = 94)

Step	Variable	<i>SE</i>	β	<i>p</i>
1	Attitude	0.185	.445	<.001
	Subjective norm	0.142	.174	.062
	Perceived behavioral control	0.088	.148	.094
	Model <i>R</i> ² = .339	0.830		<.001
2	Attitude	0.186	.419	<.001
	Subjective norm	0.141	.160	.084
	Perceived behavioral control	0.087	.154	.078
	Number of prior quit attempts	0.071	.148	.093
	<i>R</i> ² change = .021	0.822		.093
	Model <i>R</i> ² = .360			<.001

assumes that the antecedents of intention and behavior, when adequately assessed, capture individual and cultural differences in a sample (Ajzen, 1988), so-called “background variables,” eliminating the need to measure these constructs separately from the TPB constructs. Notably, we found that our sample’s mean CES-D score exceeded the cutoff score for clinically significant distress (Comstock & Helsing, 1976; Weissman et al., 1977). Depressive symptoms are more prevalent among smokers than nonsmokers (Anda et al., 1990). Further, the level of perceived stress in our sample was significantly elevated compared with the mean level observed in a large sample of working adults ($n = 10,189$, $M = 4.90$, $SD = 2.96$; Ng & Jeffery, 2003; N. Mitchell, personal communication, 13 November 2007). Perceived stress is often higher among smokers (Jorm et al., 1999; Vollrath, 1998). It has been proposed that LGBT persons are burdened with minority stress (Meyer, 2003), which leads to greater prevalence of depression and other mental health problems (Cochran, Mays, & Sullivan, 2003). Perhaps LGBT persons who smoke would benefit from culturally tailored stress management integrated into smoking cessation treatment.

Among the study’s limitations was the low response to our anonymous survey, raising concerns about possible sampling bias. Our sampling approach targeted residents of the New York City region, where smoking prevalence is among the lowest in the United States (Centers for Disease Control and Prevention, 2001). Probability sampling would provide a stronger basis for generalizing results to the LGBT subpopulation. Small numbers of transgender and bisexual persons precluded subsample analyses. Further, the study’s cross-sectional design prevented delineation of causal pathways and an explicit test of intention to quit smoking as a key predictor of smoking cessation. Although we conducted an elicitation phase that guided selection and development of survey items, theoretical constructs may not have been assessed adequately. This could explain the weaker performance of subjective norm and perceived behavioral control compared with attitudes. However, many studies applying the TPB do not assess all theory constructs, and when they do, not all the TPB’s antecedents are found to be significant (Armitage & Conner, 2001; USDHHS, 2000).

Despite these limitations, we believe that this study contributes to our understanding of cessation motivation in an understudied population. More positive attitudes toward quitting and specific beliefs that cessation would make LGBT smokers feel more like their ideal selves, improve the health of their lungs and longevity of life, and meet with the approval of partners and other important persons were related to greater motivation to quit. No LGBT-specific factors emerged as significant. It is hoped that this study will stimulate the development of interventions that improve the health of a vulnerable subpopulation and reduce health disparities based on sexual orientation.

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Declaration of Interests

Dr. Burkhalter has received support from the LGBT Community Center as consultant on smoking cessation projects. All other authors report no competing interests.

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Intention to quit smoking among LGBT

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